

claim 45. Although Batchelor refers to "a programming environment," the programming environment according to Batchelor is designed to enable one "to prototype and implement full-featured image processing and analysis systems." See Abstract of Batchelor. In other words, the scope of the programming environment disclosed in Batchelor extends to acquiring images and analyzing them. There is no disclosure that the programming environment (software) disclosed in Batchelor includes generating instructions for controlling underlying elements of a corresponding machine vision system. Furthermore, there is no disclosure that the programming environment (software) disclosed in Batchelor includes, or is based on, a hardware component simulation system or various other elements, as recited, for example, in independent Claim 45 and its dependent claims. Furthermore, there is nothing in Batchelor that suggests or enables a method of operating a programming system or a simulation system to generate a focus-dependent synthetic image based on a representation of a corresponding vision system or to provide various other operations, as recited, for example, in independent claims 65 and 69, and their dependent claims.

Batchelor discloses image analysis software that acquires and evaluates actual image data. As clearly described throughout Batchelor, a physical vision system prototype may be easily evaluated, modified, reevaluated, etc., because the software provided by Batchelor allows the images from a physical prototype system to be input and evaluated in a realistic manner without requiring that the user to have extensive machine vision training or computer training. The software "provides tools for analyzing images both interactively and automatically, and offers data gathering and accessibility." However, nowhere does Batchelor disclose that the software includes user-alterable control elements usable to determine instructions usable to control the corresponding machine vision inspection system. On the contrary, Batchelor only indicates that the software allows the user to develop image analysis application software and evaluate images obtained, for example, from prototype

hardware systems. The image analysis software does not control the vision system, but is used to analyze images collected by the vision system. The only functions arguably "controlled" by the software taught by Batchelor relate to image input and related data processing. Batchelor does not disclose software for control of operations of the vision system, such as focusing, for example, in order to control the machine vision inspection system to inspect at least one object.

As discussed on page 158 of Batchelor, the software taught by Batchelor replaces the detailed programming and software development that was previously necessary to evaluate images for prototyping systems. For example, the testing, evaluation and selection of optics and lighting designs referred to on page 160 of Batchelor and cited by the Office Action do not disclose "developing the software" as alleged on page 4 of the Office Action, but rather disclose testing, evaluation and selection of prototype optics and lighting hardware (e.g., those that satisfy "physical constraints such as space restrictions for mounting camera, optics and lighting" – as included in Examiner's quote) by using the software to evaluate the resulting actual images.

Applicant notes that the Office Action's apparent reliance on the Summary on page 162 of Batchelor is misplaced because the Summary provides no relevant details regarding the software being developed or the features or operations of the related programming environment. As described on page 159, for example, the software of Batchelor "provides the user with the ability to access image acquisition and image processing functions" and can perform modifications to the existing code, i.e., "standard well-tested tools" that perform "image acquisition, data extraction, calibration, measurements, and data reporting." Thus, as discussed above, Batchelor discloses only that the software developed relates to image data input, processing and analysis. Batchelor does not disclose developing software for control of the vision system, does not suggest programming in the absence of an actual vision system

and/or actual images, and provides no suggestion or motivation for a programming system that simulates the operation of a corresponding machine vision inspection system. In contrast, on page 160 Batchelor teaches that, "The important thing is to remember is to *experiment* with different camera and lighting arrangements until a satisfactory image is obtained. ... Image Analyst provides...tools which allow the user to *examine the image for contrast*, ensuring that the best design is selected..."

Furthermore, Applicant respectfully submits that the Office Action makes impermissible leaps to allege that subject matter recited in the pending claims and clearly missing from Batchelor and Kacyra are "obvious" or "motivated."

For example, page 5 of the Office Action states that "An artisan of ordinary skill would have been motivated to search the related optical art to find the required methods to integrate the code required to operate the camera optics in order to make the software fully functional." Applicant respectfully submits that such a statement is not a substitute for citation of a reference that actually discloses or suggests the features admittedly missing from the applied references. Such a statement is fully equivalent to reliance on the fact that the claimed subject matter is "within the capabilities of one of ordinary skill in the art." As clearly set forth in MPEP §2143.01, that fact is insufficient by itself to establish prima facie obviousness. There must be some objective reason to modify the teachings of the reference(s).

The general reference to "optics" in Batchelor cannot reasonably be considered to provide a motivation to modify Batchelor to include the features recited in the claims that are admitted by the Office Action to be missing from Batchelor. Moreover, Batchelor clearly teaches selecting optics and lighting hardware and arrangements, not programming for control of optics and lighting of a vision system. As discussed above, Batchelor teaches using its software and programming system to acquire and evaluate images generated by

prototype hardware arrangements to provide feedback that may be used to select (not program) the optics and lighting features for the vision system. Because Batchelor does not teach or suggest programming for controlling a vision system or components thereof, and does not teach a programming environment including simulated hardware or synthetic images, Applicant respectfully submits that there is no motivation to modify the teachings of Batchelor as alleged by the Office Action.

The only apparent motivation is based on impermissible hindsight based on Applicant's disclosure. Absent the required motivation, the implicit allegation that the features recited in the claims and admittedly missing from Batchelor are "obvious" in view of Batchelor is contrary to MPEP §2143.01 and therefore improper.

Also for example, the Office Action's statement that Batchelor discloses "the functional equivalent of a 'simulation system'" is without support. Batchelor does not provide any disclosure whatsoever regarding simulation of a vision system. The Office Action's reference to the testing of different lighting and camera arrangements in Batchelor does not support the conclusion of alleged equivalency.

In view of the foregoing, Applicant respectfully submits that Batchelor cannot reasonably be considered to disclose, teach or suggest the features recited in each of the independent claims. For example, in addition to failing to disclose, teach or suggest generating instructions for controlling a machine vision inspection system, Batchelor at least fails to disclose, teach or suggest (1) a user-alterable control element that affects the focus of a synthetic image representative of an image (i.e., not an actual image as in Batchelor), (2) a hardware-component simulation system (let alone one including a portion operable to represent a lens system, including a limited depth field of the lens system, or one including a communication interface portion connected to exchange control and data signals), or specific operations of the programming system to (3) generate a current focus-dependent synthetic

image of a portion of an object . . . including focus effects related to the limited depth of field of the lens system or to (4) display the current focus-dependent synthetic image, as recited in claim 45.

Applicant respectfully submits that Batchelor also suffers from one or more of the above-described deficiencies with respect to each of independent claims 55, 57, 65, 69 and 73.

Kacyra fails to make up for the above-describe deficiencies of Batchelor. Applicant declines to discuss the shortcomings of Kacyra with respect to the features recited in the claims for the sake of brevity, as Applicant contends that the asserted combination of Batchelor and Kacyra is improper and irrelevant.

To clarify, Applicant's art is not directed towards "modeling objects for use in visual inspection systems." Applicant's art *inputs* existing CAD data (a "modeled object"), and is directed generally towards the features of a *programming system* that includes realistically modeling *images*, based on the CAD data and a hardware simulation system representing an underlying corresponding machine vision inspection system. As previously suggested, Bachelor's art is simply directed toward software for acquiring and analyzing image data. Neither is directed towards modeling objects for use in visual inspection systems, therefore Kacyra is not in the same art. Furthermore, it is respectfully submitted that Kacyra is not "in the (same) art of modeling objects for use in a visual inspection system" as stated by the Office Action. On the contrary, the system of Kacyra uses an *actual* physical vision inspection system to obtain image data from an *actual* physical object, in order to create a model of the object, for use in a CAD system. for example. There is no simulated vision inspection system (only an actual physical vision inspection system), no need for a user interface portion for inputting CAD data (an actual physical object is scanned for input), no machine vision programming system including these missing elements, and there is no

suggestion, motivation, or enablement for generating a current focus-dependent synthetic image of the modeled actual object.

The programming environment taught by Batchelor bears no relation to the teachings of Kacyra. Although the programming environment taught by Batchelor arguably could be used to help program certain operations of the vision inspection system used in Kacyra, the allegation in the Office Action that it would have been obvious to have combined the methods of Batchelor with the methods of Kacyra is not supported by evidence. In other words, the required motivation to combine Batchelor and Kacyra as asserted by the Office Action is absent. See MPEP §2143.01.

Because "savings of labor and time and resources" as cited by the Office Action constitutes the motivation for the methods taught by Kacyra, such savings cannot reasonably be considered to provide motivation to combine the teachings of Batchelor that do not relate to similar labor time and resource problems. The development of software for image data analysis and selection of optics and lighting features for a vision system is entirely distinct and separate from the labor intensive, time consuming and error prone process of data gathering and organizing and using the organized gathered data to generate CAD drawings or models described in the cited portion of Kacyra. Thus, the cited portion of Kacyra cannot reasonably be considered to provide motivation to combine the teachings of Batchelor with those of Kacyra.

Therefore, Applicant respectfully submits that there is no motivation to combine the teachings of Batchelor with those of Kacyra as asserted by the Office Action. The only apparent motivation is based on impermissible hindsight based on Applicant's disclosure. Absent the required motivation, the asserted combination is contrary to MPEP §2143.01 and therefore improper. Furthermore, neither Batchelor, nor Kacyra, nor their combination provides a suggestion or motivation to provide a programming system that includes modeling

*images* including focus-dependent effects or a hardware simulation system representing an underlying corresponding machine vision inspection system. Therefore, an assertion that their combination is motivated, in order to do so, is also based on impermissible hindsight based on Applicant's disclosure.

Accordingly, Applicant respectfully submits that independent claims 45, 55, 57, 65, 69 and 73 are patentable over Batchelor and Kacyra, either alone or in permissible combination. Claims 46-54, 56, 58-64, 66-68 and 70-72 are patentable at least in view of the patentability of claims 45, 55, 57, 65 and 69 from which they variously depend, as well as for the additional features they recite. Withdrawal of the rejection of claims 45-73 is respectfully requested.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 45-73 are earnestly solicited.

Should the Examiner believe that anything further would be desirable to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



James A. Oliff

Registration No. 27,075

Holly N. Moore

Registration No. 50,212

JAO:KLK

Attachment:

Petition for Extension of Time

Date: December 23, 2005

**OLIFF & BERRIDGE, PLC**  
**P.O. Box 19928**  
**Alexandria, Virginia 22320**  
**Telephone: (703) 836-6400**

**DEPOSIT ACCOUNT USE  
AUTHORIZATION**

Please grant any extension  
necessary for entry;

Charge any fee due to our  
Deposit Account No. 15-0461